

29839 - Electronic Design Laboratory

Syllabus Information

Academic year: 2023/24

Subject: 29839 - Electronic Design Laboratory

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 440 - Bachelor's Degree in Electronic and Automatic Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Optional

Module:

1. General information

In this subject, everything learned in the electronic subjects is put into practice through the realization of an electronic project (project-based learning methodology).

It focuses on three fundamental aspects for the electronic engineering professional, such as the study of technologies, the research of real electronic components and their selection, the design of printed circuit boards and the assembly and debugging of prototypes in the laboratory.

On the other hand, and as explained in several points of this guide, the methodology used makes the students acquire transversal professional competences of great value for an engineer and that are otherwise difficult to achieve.

These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>) and certain specific targets, such as target 3.9 of goal 3, target 7.2 of goal 7, target 8.2 and 8.4 of goal 8, target 9.5 of goal 9 and target 13.3 of goal 13.

2. Learning results

In order to pass this subject, the students shall demonstrate they has acquired the following results:

- Design electronic circuits and systems using computer-aided design tools.
- Properly select electronic components, including the most suitable packaging.
- Design printed circuit boards.
- Build and debug electronic prototypes in the laboratory.

3. Syllabus

The program of the course will contain:

- Presentation of the work methodology of the course and planning of the activities to be carried out.
- Search and selection of components and other electronic resources.
- Previous studies: Components; Electronic systems.
- Conception and specification of the project.
- Laboratory assembly of circuit modules.
- Electronic development: Basic design.
- Electronic development: Schematic input.
- Electronic development: PCB design.
- Assembly and tuning of the prototype.
- Presentation of papers.

When the circumstances of teaching organization allow it, a collaboration with the degree in Engineering of Industrial Design and Product Development is proposed, so that the team work is developed by a group of electronics and design students.

4. Academic activities

The program offered to the student to help them achieve the expected results comprises the following activities:

- Practical work in the laboratory - type T3 (60 hours). Given the nature of the teaching methodology, the program takes the form of a calendar of activities that will be developed at the same time as the groups advance in the design. In some cases it involves presentations by the teacher, but most of the time is devoted to practical activities to be carried out by the students.
- Teaching assignments - type T6 (20 hours). Activities that the student will perform alone or in groups and that the

teacher will proposing.

- Student's personal work-study - type T7 (64 hours). Estimated time dedicated to the development of the project individually or in groups through creative sessions or other dynamics.
- -Assessment tests (type T8) (6 hours). In addition to the grading function, the assessment is also a learning tool with which the student checks the degree of understanding and assimilation achieved.

5. Assessment system

Given the 100% practical nature of the subject, a continuous assessment is proposed, the result of which will be the final grade in the first call (in accordance with the exceptional condition set out in article 9.4 of the Learning Assessment Standards Regulations, which was authorized for this course by the UZ).

The subject is based on the teaching methodology of project-based learning, which will be materialized in the conception, development and assembly of an electronic project of complexity and size appropriate to the length of the subject. A series of evaluable activities can be found:

Continuous assessment during the teaching period:

- Express project (30%). In the first weeks of the subject, as a preparation for the subject project and to articulate the work teams, a small electronic project of limited extension will be carried out.
- Laboratory work (10%). A project will be developed continuously throughout the semester.
- Subject project (60%). This item evaluates the work done for the achievement of the project of the subject as follows: the quality of the solution, the degree of finishing and the success in the operation; a report reflecting all the work done for the project; and the oral presentation to the teachers and classmates of the subject, being able to use computer tools dedicated to presentations. **2nd official call:**
- Subject work (60%). Consisting of an electronic design with real components, its corresponding simulation, printed circuit board design and final configuration.
- Written exam (40%). Carried out in a computer classroom. Theoretical-practical exam in which the learning results will be evaluated.